CLAIMS

What is claimed is:

1. A system for testing a packet-based communications node, the system comprising:
   (a) a packet generator for generating user data to be sent over a connection to a packet-based communications node under test;
   (b) a communication protocol stack having layers for communicating with packet-based communications nodes over a network and adding header information to user data generated by the packet generator to form packets; and
   (c) a packet replicator associated with the communication protocol stack and the packet generator for receiving packets generated by the communication protocol stack and replicating predetermined packets to the packet-based communications node under test, wherein replicating the packets includes bypassing at least one layer of the communication protocol stack.

2. The system of claim 1 wherein the communication protocol stack includes an AAL5 layer and the packet replicator resides within an AAL5 layer device driver.

3. The system of claim 1 wherein the communication protocol stack includes an Ethernet layer and the packet replicator resides in an Ethernet layer device driver.

4. The system of claim 1 wherein the packet replicator is adapted to replicate packets to the packet-based communications node under test at user-specified intervals.

5. The system of claim 4 wherein the packet replicator is adapted to repeat replication of the packets according to a user configurable repeat count during each time interval.

6. The system of claim 1 wherein the packet replicator is adapted to search for a predetermined key value in packets received from layers above the packet replicator in the communication protocol stack and to replicate only those packets that match the key value.

7. The system of claim 1 comprising a controller state machine for controlling operations of the packet generator, the communication protocol stack, and the packet replicator.

8. The system of claim 7 wherein the controller state machine includes a graphical user interface whereby a user defines states for controlling operations of the packet generator, the communication protocol stack, and the packet replicator.

9. The system of claim 1 comprising a test platform including a plurality of link interface controllers, each link interface controller including a processor and a packet memory, wherein an instance of the packet generator, the communications protocol stack, and the packet replicator is executed by each processor.

10. The system of claim 8 wherein the packet replicator is adapted to store packets received from the packet generator in the packet memory.

11. The system of claim 1 comprising a plurality of link interface modules, one link interface module coupled to each link interface controller, wherein the link interface modules implement at least a portion of the communication protocol stack.

12. A method for testing throughput of a packet-based communications node, the method comprising:

    (a) generating a packet for testing a packet-based communications node;

    (b) passing the packet through layers of a protocol stack and adding a header to the packet for each layer;

    (c) at a predetermined layer of the protocol stack, storing a copy of the packet including information added by layers above the predetermined layer; and

    (d) replicating, from the predetermined layer, copies of the packet to the packet-based communications node under test.

13. The method of claim 12 wherein replicating copies of the packet from a predetermined layer of the protocol stack includes replicating copies of the packet from an AAL5 layer of the protocol stack.

14. The method of claim 12 wherein replicating copies of the packet from a predetermined layer of the protocol stack includes replicating copies of the packet from an Ethernet layer of the protocol stack.

15. The method of claim 12 comprising establishing a plurality of connections with the packet-based communications node under test, generating packets for each connection, and replicating the packets to the packet-based communications node under test over each of the connections.

16. The method of claim 12 wherein replicating the packet to the packet-based communications node under test includes replicating the packet at user specified intervals to the packet-based communications node under test.

17. The method of claim 16 comprising repeating the packet according to a user specified repeat count during each of the predetermined intervals.

18. The method of claim 12 comprising controlling steps (a) – (e) using a user defined state machine.

19. The method of claim 12 comprising, at the predetermined layer, receiving a plurality of packets from layers above the predetermined layer in the communication protocol stack, searching the packets for a predetermined key value, and replicating packets that match the key value to the packet-based communications node under test.

20. The method of claim 12 wherein replicating the packets to the packet-based communications node under test includes replicating the packets to a gateway GPRS support node.

21. The method of claim 12 wherein replicating the packets to the packet-based communications node under test includes replicating the packets to a signaling GPRS support node.

22. The method of claim 12 wherein replicating the packets to the packet-based communications node under test includes replicating the packets to a radio network controller.

23. A computer program product comprising computer-executable instructions embodied in a computer-readable medium for performing steps comprising:

(a) generating user data packets for testing a packet-based communications node;

(b) passing the user data packets downward through a communication protocol stack;

(c) at a predetermined layer in the communications protocol stack, searching the packets for a predetermined key value; and

(d) in response to detecting a packet having the key value, storing the packet and replicating the packet to the packet-based communications node under test.

24. The computer program product of claim 23 wherein searching the packets for a predetermined key value includes searching the packets for a GPRS tunnel protocol identifier.

25. The computer program product of claim 23 wherein searching the packets for a predetermined key value includes searching the packets for an Internet protocol address.

26. The computer program product of claim 23 wherein replicating the packet to the packet-based communications node under test includes replicating the packet to a signaling GPRS support node (SGSN).

27. The computer program product of claim 23 wherein replicating the packet to the packet-based communications node under test includes replicating the packet to a gateway GPRS support node (GGSN).

28. The computer program product of claim 23 wherein replicating the packet to the packet-based communications node under test includes replicating the packet to a radio network controller (RNC).